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Modeling of Experiments Conducted to Determine Nuclear Weapon Disablement Threshold by HE Initiation Produced by Small Projectile Impact

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Abstract

The ALE3D code has been used to model the impacts of small steel parallelepiped projectiles onto two-dimensional models of the Generic Rest of World Nuclear Threat section of theater missiles. The targets contained Comp-B explosives whose behavior was modeled with the reactive flow Ignition and Growth model developed at LLNL. The tests included diagnostics allowing determination of the timing and character of the HE reaction. We present three modeling calculations and compare them with the experimental results. Two calculations result in a detonation and a negligible HE reaction, in excellent agreement with the experimental results. The third calculation results in significant HE reaction where a detonation was observed.

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